(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication numb r: **0 152 650**
B1

(12) # EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification: **02.11.88**

(51) Int. Cl.⁴: **H 02 J 7/02**, H 01 M 10/46

(21) Application number: **84201911.9**

(22) Date of filing: **19.12.84**

(54) **Charging device.**

(30) Priority: **09.01.84 NL 8400065**

(43) Date of publication of application:
28.08.85 Bulletin 85/35

(45) Publication of the grant of the patent:
02.11.88 Bulletin 88/44

(84) Designated Contracting States:
AT DE FR GB

(56) References cited:
CH-A- 429 859
CH-A- 484 530
GB-A-1 120 440
NL-A- 283 789
US-A-3 360 708

(73) Proprietor: **N.V. Philips' Gloeilampenfabrieken**
Groenewoudseweg 1
NL-5621 BA Eindhoven (NL)

(72) Inventor: **Camens, Murray Ivan Charles**
c/o INT. OCTROOIBUREAU B.V. Prof. Holstlaan 6
NL-5656 AA Eindhoven (NL)

(74) Representative: **Gorter, Willem Karel et al**
INTERNATIONAAL OCTROOIBUREAU B.V. Prof. Holstlaan 6
NL-5656 AA Eindhoven (NL)

EP 0 152 650 B1

Courier Press, Leamington Spa, England.

Description

The invention relates to a charging device for charging a rechargeable electric power source, the charging device comprising two sections which can be assembled in two different positions relative to each other, namely a rest position and a charging position, a first section being adapted to receive at least one rechargeable electric power source and a second section being provided with connector pins which are adapted to co-operate with an electric mains socket and which are connected to the components of the charging circuit in the second section, the connector pins being covered by the first section in the rest position and being clear of the first section in the charging position, the rechargeable power source in the first section being electrically connected to the electric components of the charging circuit in the second section in the charging position and wherein in the rest position the longitudinal direction of the first section, which corresponds to the longitudinal direction of the electric power source, extends in the longitudinal direction of the connector pins.

Such a charging device is known from, for example, US—A—3.360.708. In the charging position of this known device the two sections are mounted one upon the other in the longitudinal direction of the connector pins. When the device is now plugged into a wall socket an unfavourable bending movement is excerted on the fastening means between the sections and on the connector pins. Also the device extends over its whole length into the room where the wall socket is present and thus forms an obstacle in that room.

The invention whose aim it is to remedy these effects, is characterized in that in the charging position the longitudinal direction of the first section extends transversely to the longitudinal direction of the connector pins, the first section comprising two limbs whose ends carry projections which in both positions constitute a snapped connection with corresponding recesses in the second section.

A special embodiment of the invention is characterized in that the limbs have different widths and the second section has been provided with corresponding slots whose widths differ in conformity with the widths of the limbs.

Embodiments of the invention will now be described in more detail, by way of example, with reference to the Figures.

Fig. 1 is a perspective view of a charging device in the closed condition.

Fig. 2 shows the charging device of Fig. 1 with the two sections separated from each other.

Fig. 3 shows the charging device of Figs. 1 and 2 in the assembled position of the two sections during charging.

Figs. 4 and 5 show modifications of the embodiment shown in Figs. 1 to 3.

The charging device shown in Figs. 1 to 3 comprises two sections 1 and 2 which can be assembled in two different positions relative to each other. In the closed condition shown in Fig. 1 the sections 1 and 2 are in the so-called rest position and Fig. 3 shows the so-called charging position.

Two rechargeable electric power sources, which are batteries 3 (Fig. 2), can be fitted into a first section 1. The second section 2 comprises connector pins 4 and electric components, known *per se*, which generally include a transformer and a rectifier, not shown. These electric components are arranged as a charging circuit and are connected to contact faces 5 of section 2. These contact faces 5 are externally accessible.

In the position shown in Fig. 1, the section 1 does not contain batteries but the connector pins 4 of section 2 are covered by section 1. The longitudinal direction P1 (Fig. 2) of the connector pins 4 then corresponds to the longitudinal direction P2 of the batteries 3 when situated in section 1.

Section 1 has been provided with slightly elastic limbs 6 whose ends carry inwardly directed projections 7. In the position shown in Fig. 1 the limbs 6 engage in corresponding recesses 8 (Fig. 2) on opposite sides of the second section 2, the projections 7 engaging recesses 9. In this way the two sections are snapped onto each other.

Fig. 2 shows the two sections 1 and 2 separated from each other, section 1 containing the batteries 3. The terminals of the batteries 3 are in contact with an electrical contact member 10. This contact member 10 also constitutes an elastic pressure member for the batteries 3 in the charging position shown in Fig. 3.

In the charging position shown in Fig. 3, the longitudinal direction P2 of the batteries extends transversely to the longitudinal direction P1 of the connector pins 4. By means of the recesses 11 and the recesses 12 on opposite sides in section 2 in combination with the limbs 6 the sections 1 and 2 can also be snapped onto each other in this position. The terminals 13 of the batteries 3 are then in electrical contact with the charging circuit in section 2 *via* the contact faces 5 (Fig. 2). In this situation the electrical contact member 10 is deformed elastically and provides the required contact pressure between the terminals 13 and the contact faces 5.

In this position the connector pins 4 are clear of section 1 and can be inserted directly into a mains socket, after which the batteries 3 will be charged.

By mounting section 1 transversely onto section 2, the distance between section 1 and the connector pins 4 is small in the position shown in Fig. 3. The weight of section 1 containing the batteries then exerts a small moment relative to the connector pins 4, so that the mechanical load to which the connector pins 4 are subjected when plugged into a mains socket is as favourable as possible.

This construction does not require a lead for connecting the charging device to the mains socket.

By giving the limbs 6 different widths and also giving the two pairs of recesses 8 and 11 corre-

sp nding to th respectiv limbs 6 different widths it is ensured that the first section 1 cannot be m unt d onto th second section 2 in an incorrect charging position.

Fig. 4 shows a modification of the embodim nt shown in Figs. 1 to 3 and only shows section 1 of the charging device. Section 1 can now hold only one battery 3. An electrically conducting strip 14 is connected to the contact member 10 and extends up to one of the limbs 6. In the position shown in Fig. 3 this strip 14 is in contact with a corresponding contact face on section 2.

Fig. 5 shows another modification of the embodiment shown in Figs. 1 to 3 and also shows section 1 only. This section 1 not only comprises a compartment 15 for the batteries 3 but also a compartment 16 for the connector pins 4, so that for the position of Fig. 1 the batteries need not be removed from section 1. *Via* electrical contact members 17 which are situated near the limbs 6 and which are in contact with the terminals of the batteries 3 it is again possible to establish a connection with the electric components in section 2 in the position shown in Fig. 3.

Claims

1. A charging device for charging a rechargeable electric power source (3), the charging device comprising two sections (1, 2) which can be assembled in two different positions relative to each other, namely a rest position and a charging position, a first section (1) being adapted to receive at least one rechargeable electric power source (3) and a second section (2) being provided with connector pins (4) which are adapted to co-operate with an electric mains socket and which are connected to the components of a charging circuit in the second section, the connector pins (4) being covered by the first section (1) in the rest position and being clear of the first section in the charging position, the rechargeable power source (3) in the first section (1) being electrically connected to the electric components of the charging circuit in the second section (2) in the charging position, and wherein in the rest position the longitudinal direction of the first section (1), which corresponds to the longitudinal direction of the electric power source (3), extends in the longitudinal direction of the connector pins (4) characterized in that in the charging position the longitudinal direction of the first section (1) extends transversely to the longitudinal direction of the connector pins (4), the first section (1) comprising two limbs (6) whose ends carry projections (7) which in both positions constitute a snapped connection with corresponding recesses (8, 9, 11, 12) in the second section (2).

2. A charging device as claimed in Claim 1, characterized in that the limbs (6) have different widths and th second section (2) has be n provided with corresponding slots (8, 9, 11, 12) wh se widths differ in conf rmity with th widths f the limbs.

Pat ntansprüche

1. Ladevorrichtung zum Aufladen ein r aufladbaren l ktrischen Speisequelle (3), wob i di se Ladevorrichtung zwei Teile (1, 2) aufweist, die in zwei unterschiedlichen Lagen zueinander zusammengefügt werden können, und zwar in einer Ruhelage und einer Aufladelage, wobei ein erster Teil (1) wenigstens eine aufladbare elektrische Speisequelle (3) aufnehmen kann und der zweite Teil (2) mit Steckerstiften (4) versehen ist, die mit einer Buchse des elektrischen Versorgungsnetzes zusammenarbeiten können und die mit den Bauelementen der Ladeschaltung in dem zweiten Teil verbunden sind, wobei die Steckerstifte (4) in der Ruhelage durch den ersten Teil (1) bedeckt sind und in der Aufladelage frei vom ersten Teil liegen, wobei in der Aufladelage die aufladbare Speisequelle (3) in dem ersten Teil (1) mit den elektrischen Bauelementen der Aufladeschaltung in dem zweiten Teil (2) elektrisch verbunden ist und wobei die Längsrichtung des ersten Teils (1), die der Längsrichtung der elektrischen Speisequelle (3) entspricht, in der Ruhelage sich in der Längsrichtung der Steckerstifte (4) erstreckt, dadurch gekennzeichnet, dass in der Aufladelage die Längsrichtung des ersten Teils (1) sich quer zu der Längsrichtung der Steckerstifte (4) erstreckt, wobei der erste Teil (1) zwei Zungen (6) aufweist, deren Enden Vorsprünge (7) aufweisen, die in beiden Lagen eine Schnappverbindung mit entsprechenden Ausnehmungen (8, 9, 11, 12) in dem zweiten Teil (2).

2. Ladevorrichtung nach Anspruch 1, dadurch gekennzeichnet, dass die Zungen (6) unterschiedliche Breiten haben und der zweite Teil (2) mit entsprechenden Schlitzen (8, 9, 11, 12) versehen ist, deren Breiten entsprechend den Breiten der Zungen verschieden sind.

Revendications

1. Dispositif de charge d'une source d'énergie électrique rechargeable (3), comportant deux parties (1, 2) pouvant être assemblées dans deux positions différentes, c'est-à-dire une position de repos et une position de charge, une première partie (1) étant conçue pour recevoir au moins une source d'énergie électrique rechargeable (3) et une seconde partie (2) étant munie de broches de connexion (4) conçues pour coopérer avec une prise de courant électrique murale et reliées aux composants du circuit de charge contenu dans la seconde partie, broches de connexion (4) qui, dans la position de repos, sont recouvertes de la première partie (1) et, dans la position de charge, sont dégagées de la première partie, alors que, dans la position de charge, la source d'énergie rechargeable (3) prévue dans la première partie (1) est reliée électriquement aux composants électriqu s du circuit d charg prévu dans la seconde parti (2) et que, dans la position d repos, le s ns l ngitudinal d la premièr partie (1), qui correspond au sens longitudinal de la source d' nergie électrique (3) s'ét nd dans le

sens longitudinal des broches de connexion (4), caractérisé en ce que, dans la p sition de charge, le sens longitudinal de la première partie (1) s'étend transv rsalement au sens l ngitudinal des broches de connexion (4), la première partie (1) étant munie de deux languettes (6) dont les extrémités présentent des bossages (7) qui, dans les deux positions, forment avec des évidements correspondants (8, 9, 11, 12) dans la seconde partie (2) un liaison à ncliquetag .

2. Dispositif de charge selon la revendication 1, caract´risé en ce que l s languettes (6) ont des largeurs différentes et en ce que la seconde partie (2) présente des rainures correspondantes (8, 9, 11, 12) dont les largeurs diffèrent de la même manière que les largeurs des languettes.

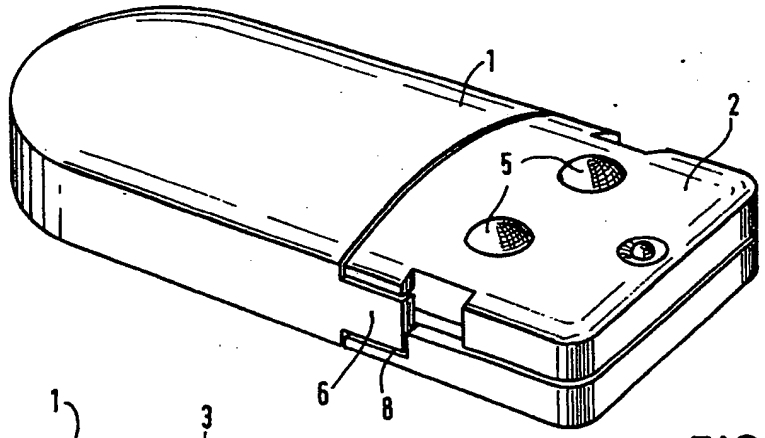

FIG.1

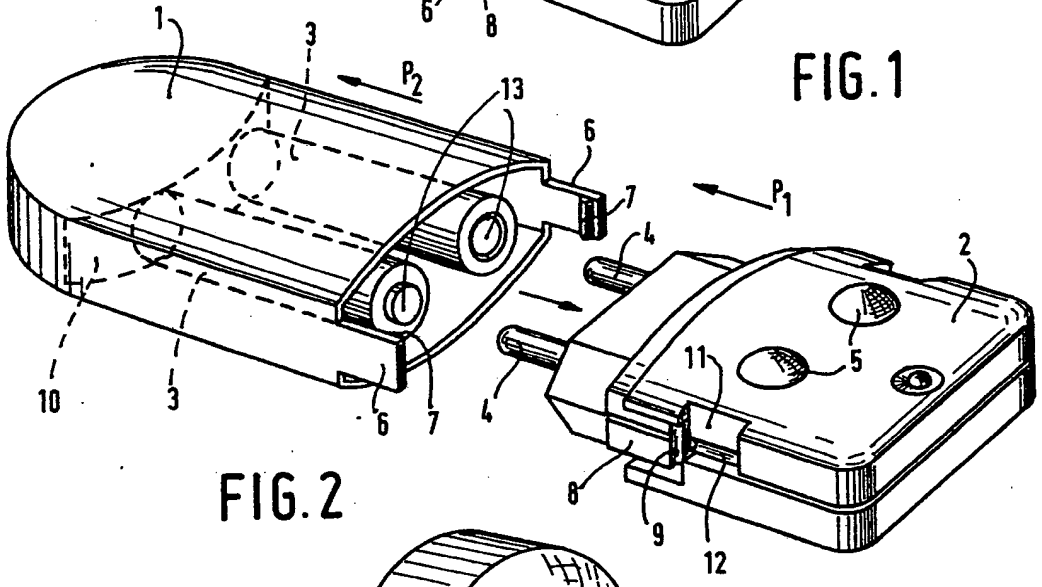

FIG.2

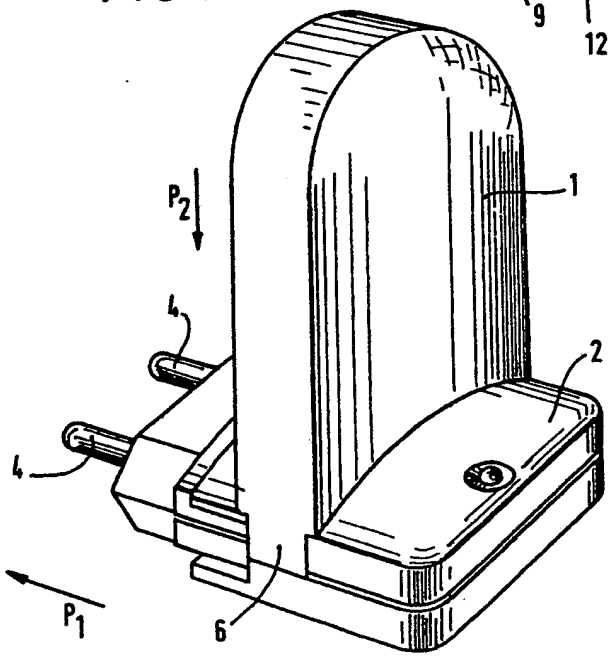

FIG.3

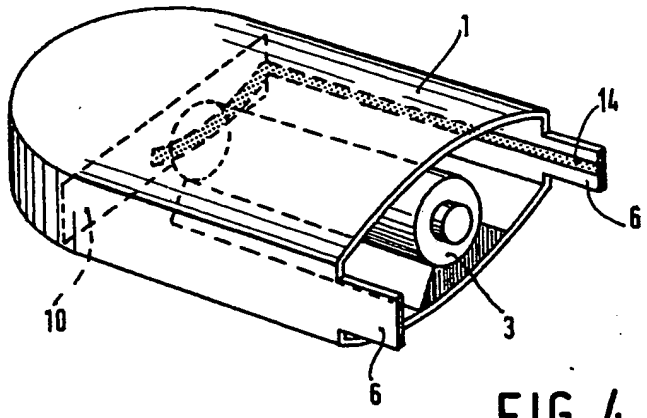

FIG.4

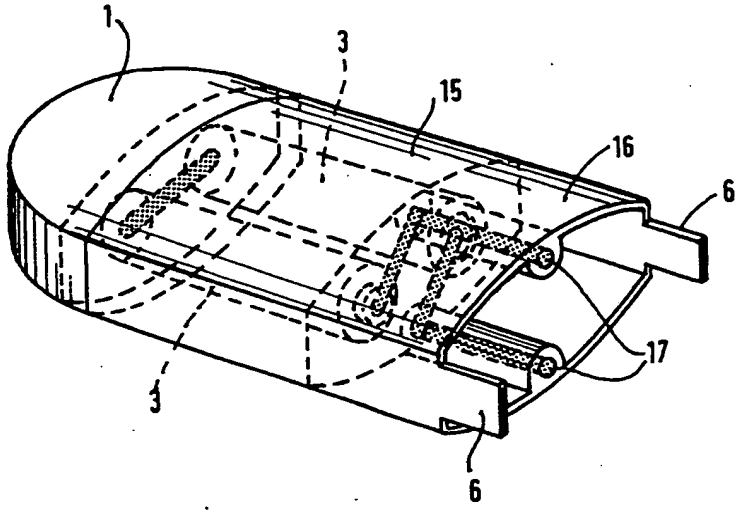

FIG.5